NOTES AND REVIEWS

W. E. KNOWLES-MIDDLETON. Meteorological Instruments. Toronto (University of Toronto Press), 1941. 213 pp., 160 figs.

This volume is the first general textbook on its subject in the English language to be published since Cleveland Abbe's *Treatise on Meteorological Apparatus and Methods* in the "Report of the Chief Signal Officer for 1887." The successive chapters cover the instruments commonly used to measure atmospheric pressure, surface temperature (air, soil, and water), humidity, precipitation and evaporation, surface wind (speed and direction), upper-air wind velocity, the motions and heights of clouds and the sizes of cloud or fog droplets, and the duration of sunshine. A concluding chapter is devoted to meteorographs and radiosondes. Numerous references to the literature are included throughout the book.

Charles B. Tuch, the designer of the barometer cistern that bears his name, died in Washington, D. C., on August 1, 1941, at the age of 91, and was buried in Arlington National Cemetery with military honors.

During the early years of the Weather Bureau, first under the Signal Corps (in which he enlisted on April 11, 1879) and later under the Department of Agriculture, Mr. Tuch was engaged in the instrument work of the Bureau, where his faithful and conscientious services were of the greatest value. He became the head instrument maker; and had charge particularly of the repair, calibration, and shipping of mercurial barometers, in which he excelled anyone else. Prior to about 1890, the only *self-recording* instrument at any of the field stations was the Gibbon anemometer register; as barographs, thermographs, and other self-recording instruments were introduced later, their care was also assigned to Mr. Tuch.

The two mercurial barometers with which each station has always been equipped were perhaps the most important of all the instruments at the stations. Mr. Tuch's chief duties were to maintain the readings of these at the highest possible accuracy. At that time the barometers were of the so-called "Fortin" type, having glass and boxwood cisterns with chamois skin bags permitting of the adjustment of the mercury level. The maintenance of these instruments involved not only the cleaning and frequent renewal of the cisterns, but also the fitting of new glass barometer tubes, which had first to be filled with vacuum-distilled mercury of the highest possible purity. Before issue for use, each instrument had to be carefully compared, by readings extending over several days, with the primary standards of the Bureau, and its scale adjusted until the correction for instrumental error was found to be no greater than four thousandths of an inch. The experience gained in this work led to the invention of the so-called Tuch barometer cistern, in which the perishable boxwood chamois skin container for the mercury was replaced by a sturdy metal cylinder with mercury-tight plunger to adjust the level of the mercury to the ivory point for a reading.

Mr. Tuch remained connected with the Weather Bureau until 1916.

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR NOVEMBER 1941

[Climate and Crop Weather Division, J. B. KINCER in charge]

AEROLOGICAL OBSERVATIONS

By HOMER D. DYCK

Mean surface temperatures for November were from 2° to 4° F. above normal over most of the country with the exception of an area in the central Gulf States which was slightly below normal.

At 1,500 meters above sea level the 5 a. m. resultant winds for November were from directions to the south of normal over most of the country with the exception of Texas and Oklahoma, where they were from directions to north of normal. Although a comparison of the morning resultant winds at 3,000 meters was not possible for the lake region, the Ohio Valley, California, and Nevada, the winds at this level were from directions to the south of normal over most of the rest of the United States with the exception of New Mexico, Oklahoma, and Texas, where resultant winds were to north of normal. At 5,000 meters a good comparison of the 5 p. m. resultant winds with the corresponding 5 a. m. normals was not possible over most of the country. It may be noted, however, that these afternoon winds were from directions to north of normal over California and the southern plateau region and from south of normal over the central Great Plains.

At 1,500 meters resultant wind velocities were above normal over the northern half of the country, west of the Rockies generally and over the central Gulf States, and below normal elsewhere. At 3,000 meters a comparison, of wind velocities, was not possible over the lake region, the Ohio Valley, California, and Nevada, but resultant velocities were below normal generally over the southeast, the southern plateau and extreme northern Montana and above normal elsewhere. At 5,000 meters all stations where a comparison of the 5 p. m. resultant velocities with the corresponding 5 a. m. normals was possible, had above normal velocities. These stations were located over the western half of the country and the central and southern Great Plains.

A correlation between mean surface temperature departures and deviations from normal resultant wind directions is evident. At both 1,500 and 3,000 meters there are areas where a turning to northward of normal took place which have the same general shape as the area where below normal surface temperatures occurred. These areas where the winds turned to northward are, however, displaced somewhat to westward of the area where below-normal temperatures were recorded. The remainder of the country recorded above-normal temperatures and resultant winds to south of normal generally.

When the 5 p. m. resultant directions are compared to the corresponding 5 a. m. resultant directions, a turning to northward during the day is noted at the 1,500 meter level over the lake region, the upper Mississippi Valley, Alabama, Georgia, and South Carolina, while a turning to southward occurred over the rest of the country generally. At the 3,000 meter level no well marked pattern of change was evident; it may be noted, however, that the number of stations where turning to southward during the day occurred was about double the number where the opposite shift occurred.

The 5 p. m. resultant velocities at 1,500 meters were lower than the corresponding 5 a. m. velocities over the Atlantic States, the Ohio Valley, the Gulf States, and the northwest generally and were above the morning velocities